



<http://www.wmo.int/thorpex>



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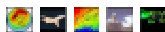
## The THORPEX Mission

***THORPEX: a Global Atmospheric Research Programme*** is an international research programme to accelerate improvements in the accuracy of *1 to 14-day* weather forecasts for the benefit of society and the economy.

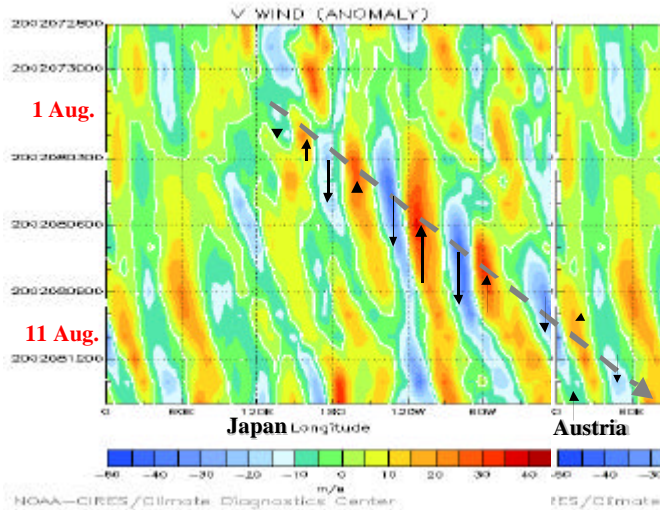
The programme builds upon ongoing advances within the research and operational-forecasting communities. It will make progress by enhancing international collaboration between these communities and with users of forecast products.



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# Upstream Influence on Severe Weather



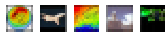
Hovmöller (time-longitude) diagram of the 250-mb meridional wind component ( $\text{ms}^{-1}$ ) for the period 28 July - 14 August 2002 and the latitudinal belt 40-60° N.

A Rossby wave train was excited by cyclogenesis off Japan, followed by rapid downstream development of high-amplitude Rossby waves, *culminating in extreme flooding in central Europe.*

Figure reproduced from *THORPEX International Science Plan*

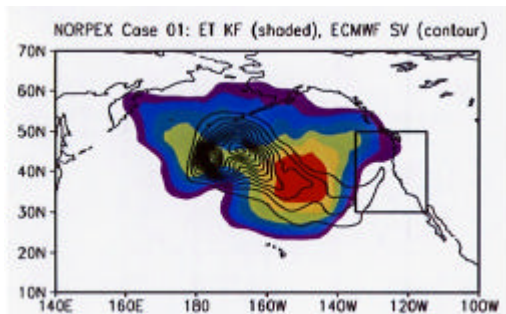


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# New Idea - Adaptive Observations and DA

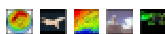
1. Identify *sensitive regions* with large influence on forecast area.
2. *Target* additional observations in sensitive region.



Two calculations of sensitive regions for a 24 hour forecast for the area in the box at right (Majumdar et al., *QJRM*, **128**, 2527)

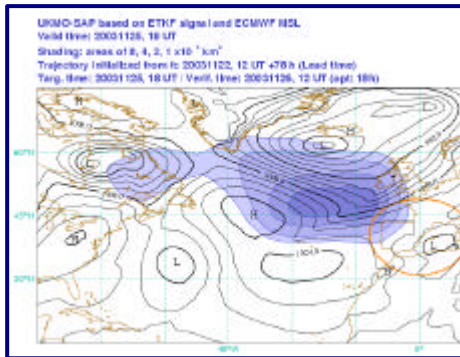


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## New Idea - Adaptive Observations and DA

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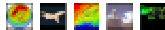


Sensitive region for a 78 hour forecast for the area in the circle over Europe

(UKMO, see also Dörnbrack et al., 2004)



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## International Science Plan

THORPEX Research has 4 themes:

### A) Predictability and Dynamical Processes

- increased knowledge of global-to-regional influences on the initiation, evolution and predictability of high-impact weather

### B) Observing System

- interactive forecast systems (e.g. targeted observations)

### C) Data Assimilation and Observing Strategies

- advanced data assimilation systems and numerical forecast models

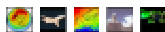
### D) Social and Economic Applications

- user-specific probabilistic forecast products

Not included, e.g.: subgrid-scale processes



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# THORPEX Implementation Plan (TIP)

Scientific Objective to be achieved through several instruments:

## THORPEX Observing System Experiments (TOST)

- new observing systems, innovative use of current systems

## THORPEX Regional Campaigns (TReC)

- testing of all components of interactive prediction system in a specific region (coordinated by regional committees)

## THORPEX Interactive Grand Global Ensemble (TIGGE)

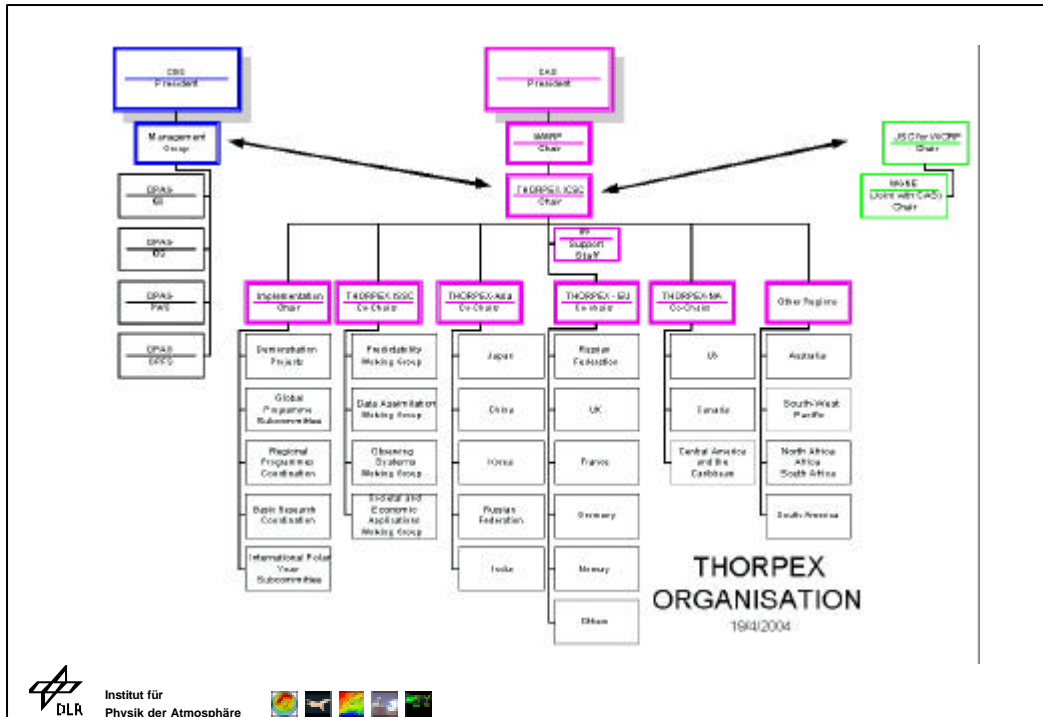
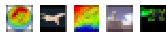
- global demonstration project, including global observing system experiment and multi-model, multi-analysis ensemble prediction system

## Links to other programmes in and out of WMO:

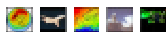
- e.g. CBS, WNGE, WCRP (e.g. GEWEX), COPES, IPY, AMMA



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## European Regional Committee

### Purpose:

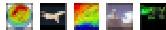
1. Coordinate European input to THORPEX planning  
(e.g. *TIP*)
2. Link THORPEX research with EU and national activities  
(e.g. *MEDEX, COPS(?)*)
3. Take leading role in EU funding initiatives

### Membership:

Co-Chairs: D. Richardson, G. Craig  
P Arbogast (FR)                      J. Caughy (EUCOS)  
H. Huang (DEN)                      A. Jansa (ES)  
S. Jones (DE)                      M Leutbecher (ECMWF)  
T. Nordeng (NO)                      F. Rabier (FR)  
M. Rottach (CH)                      A. Trevisan (IT)



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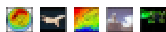


## ATReC: Atlantic THORPEX Regional Campaign

- Organised by EUCOS (EUMETNET Composite Observing System), with EUMETNET (18 European Met services), NOAA, NASA, Environment Canada, EUMETSAT, UCAR, NCAR, DLR and NRL.
- Focussed on short range (24 to 72 hours) regional scale NWP over Europe and the eastern seaboard of Canada and the USA
- Sensitive regions from ECMWF, Met O, MeteoFrance, NRL.
- Duration 9 weeks (13.10.03 - 9.12.03)
- 32 cases identified for targeted observations:
  - 23000 additional AMDAR observation reports,
  - 65 extra ascents from ASAP ships,
  - 214 additional radiosonde ascents and
  - 277 aircraft dropsonde profiles (including DLR Falcon)



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## Links to COPS?

European THORPEX community considering a TReC in 2007-8 (approx.) - as preparation for global experiment 2010-2012

Interest in coordinating with regional campaigns, e.g. COPS, MEDEX, IPY

Could hold a THORPEX experiment upstream of IOP (where is upstream?)

ADM-Validation and usage of ADM data beginning 2008 and of HALO starting 2008



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